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### (54) CURABLE COMPOSITION

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a curable composition giving a cured material which ensures practical curability and recovery properties and has mechanical properties including high strength and high elongation.

SOLUTION: The curable composition comprises (A) an organic polymer having at least one siliconcontaining group which has a hydroxy group or a hydrolyzable group bonded to the silicon atom and 
which is crosslinkable by forming siloxane bonds, and (B) one or more sorts of metal carboxylates 
selected from calcium carboxylate, vanadium carboxylate, iron carboxylate, titanium carboxylate, 
potassium carboxylate, barium carboxylate, manganese carboxylate, nickel carboxylate, cobalt 
carboxylate and zirconium carboxylate.

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2.\*\*\*\* shows the word which can not be translated. In the drawings, any words are not translated.

### SLAIMS

[Claim(s)]

which can construct a bridga by forming a siloxane bond, it becomes considering an amine compound group or a hydrolytic basis combined with a silicon atom, and have at least one silicon content group A) While containing an organic polymer and (B) carboxylic acid ziroonium which have a hydroxyl as an essential ingredient as a (C) ingredient,

(B) A hardenability constituent, wherein a carboxylic acid zirconium of an ingredient is a carboxylic acid zirconium in which the melting point has an acid radical of carboxylic acid which is 65 ≠≠ or less.

A) A number average molecular weight is within the limits of 500-50,000, and an organic polymer of an ingredient is a general formula to an end and/or a side chain of a main chain (1). : Claim 2

R124 | F34 Formula 1]

× stoke

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hydroxyl group or a hydrolytic basis independently, respectively, a is 0, 1, 2, or 3, 5 is 0, 1, or 2, and a and b are not simultaneously set to 0. m — the integer of 0, or 1–19 — it is — the hardanability the carbon numbers 6-20, an analkyl group of the carbon numbers 7-20, or (R') 3SiO independently, espectively. - (R') respectively -- independent -- the substitution of the carbon numbers 1-20, or R<sup>1</sup> and R<sup>2</sup> among a formula) They are an alkyl group of the carbon numbers 1-20, an aryl group of constituent according to claim 1 having one or more hydrolytic silyl groups per molecule expressed. in unsubstituted hydrocarbon group -- it is -- it is the Tori ORGANO siloxy group shown. X is a

The hardenability constituent according to claim 2, wherein X is an alkoxy group. Claim 3]

A) A hardenability constituent given in any 1 paragraph of Claims 1-3 whose organic polymers of an ngredient are a polyoxyalkylene series polymer and/or a saturated hydrocarbon system polymer. Claim 4]

The hardenability constituent according to claim 4 which is a polymer, wherein said saturated hydrocarbon system polymer has a repeating unit resulting from isobutylenc 50% of the weight or nore in a total amount.

birconium of an ingredient uses as the main ingredients carboxylic acid metal salt expressed with a (B) A hardenability constituent given in any 1 paragraph of Claims 1-5 to which a carboxylic soid general formula (12). Claim 6

The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a parbon carbon double bond.) Zr(O) (OCOR), (12)

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JP,2008-179830,A [CLAIMS]

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metal salt which has an acid radioal of carboxylic acid whose carbon numbers in which carboxylic acid (B) The hardenability constituent according to any one of claims 1 to 6 which is the carboxyllo acid metal salt of an ingredient contains carbon of a carbonyl group are 2-17.

oarboxylic acid group content compound in which carboxylic acid metal salt of an ingredient is chosen (B) A hardenability constituent given in any 1 paragraph of Claims 1-6 which are metal salt of a from octylic acid, 2-ethylhexanoic acid, nec decanoic acid, cleic acid, or naphthenic acid.

(A) A hardenability constituent given in any 1 paragraph of Claims 1-8 containing the (B) ingredient of quantity which serves as 0,005 - 5 weight section by metallic element conversion contained in the (B) ingredient to ingredient 100 weight section, [Claim 10] [Claim 9]

(A) A hardenability constituent given in any 1 paragraph of Claims 1–8 containing the (B) ingredient of quantity which serves as 0.005 - 5 weight section by metallic element conversion contained in the (B) ingredient, the (C) ingredient 0.01 - 20 weight sections to ingredient 100 weight section.

[Translation done.]

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## DETAILED DESCRIPTION

[Detailed Description of the Invention] Field of the Invention] in this invention, it has the hydroxyl group or hydrolytic basis combined with the silicon atom, and a

Therefore, it is related with the hardenability constituent containing the organic polymer which has a illicon content group (henceforth a "reactive silloon group") which can construct e bridge. siloxane bond is formed.

## Background of the Invention

t is known that the organic polymer which contains at least ona reactive silicon group in a molecule accompanied by the hydrolysis reaction of a reactive silicon group, etc., and a rubber-like hardened has the interesting character in which construct a bridge by formation of the siloxane bond meteriel is obtained with hygroscopic surface moisture etc. elso in a room temperature.

oolyisobutylene system polymer, It is indicated by JP,SS2-73998.A, JP.H5-125272,A, JP,H3-72527,A. n the polymer which it has, these reactive silicon groups a polyoxyalkylene series polymer and a JP.S63-6003,A, JP.S63-6041,A. JP.H1-38407,A, JP.H8-231758,A, etc.

produced industrielly, and are widely used for uses, such as a sealing meterial. adhesives, and a paint specially a polyoxyalkylene series polymer and a polyisobutylene system polymer are already

heat resistance, a water resisting property, weatherebility, etc., if the hardened material obtained is used for a structural esaling material, the sealing material for multiple glace, etc., it is effective. The 50% of the weight or mora in a total amount is preferred as a sealent aiming at moisture proof from eobutylene system polymer which has a repeeting unit which furthermore originates in isobutylene Whan an organic polymer is a saturated hydrocerbon system polymer especially, since it excels in especielly the thing to excel in low moisture permeability and low ges permeability.

watertight and airtightness becomes very important, and revealing sufficient elongation and intensity Such a sealing material generally fills up the joined part and crevice between various members, the flattery nature to the use part ranging from being used to a long period of time in order to give

s called for. 0000

purpose of a silanol condensation catalyst being used for bridge construction hardening of an organic bisacatylacetonate, is used widely, and when the movement of the part which places especially a sealing material is lerge, since the herdened material which has stability is obtained, many divalont tin condensation reaction. As such a silanol condensation catalyst, divelent tin, such as octylic acid (2-Amine compounds, such as lauryl amine, are used together as a co-catalyst in many cases for the ethylhexanoic acid) tin, The tin series catalyst represented by tatrevalant tin, such es dibutyltin polymer which, on the other hand, has such a reactive silicon group, and also accelerating a

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JP,2008-179830,A [DETAILED DESCRIPTION]

slongation of a herdanad metarial which ere acquired may be insufficient, and an improvement of the compound of a co-catalyst and is usad as a curing catalyst of the (A) ingredient, the intensity end dowever, when octylic acid tin which is divalent tin, for example is used together with the amine urther physical properties is desired.

nardened meterial obtained has emollience, i.e., having the cheracter to follow to the long-term stress setalyst of 1 liquid mold-curing nature constituent. However, since toxicity in case a small amount of Atthough most is a dibutytkin type, the latter tetravalent tin series oatalyst being used now, While the change from the outside end fast curability, it is broadly used from the ability to apply as a ouring tributyltin contains in this is regarded as questionable, development of the silanol condensation catalyst of a non-tin series is desired.

with carboxylate of tin. As an exemple in which the carboxylic acid metal salt of non-tin was used for organopolysiloxane constituent, the carboxylic acid metal selt of various kinds of non-tin is indicated the curing catalyst of the constituent which, on the other hand, contains the organic polymer which 2860,A) and cerboxylic acid cerium (JP.2000-313814,A), there was no example broadly exemined in n JP,S35-2795,B, JP,S32-3742,B, JP,S35-9639,B, JP,S37-3271,B, etc., As a curing catalyst of an has a reactive silicon group, Although there were carboxylic acid bismuth (JP.H5-39428,A, JP.H9-

various carboxylio acid metal salt until now. Patant documents 1] JP.532–73998.A Patent documents 3] JP.HS-12227.A Patent documents 4] JP.HS-12227.A Patent documents 6] JP.533–6003.A Patent documents 6] JP.533–601.A Patent documents 6] JP.1343-947.A Patent documents 7] JP.H-1-3407.A

Patent documents 11] JP.S37-3271.B etc. Patent documents 10] JP.S35-9639.B Patent documents 12] JP,H5-39428,A Patent documents 8] JP,S35-2795,B Patent documents 9] JP,S32-3742,B

Patent documents 14] JP,2000-313814,A Patent documents 13] JP,H9-12860,A Description of the Invention

Problem(s) to be Solved by the Invention] The purpose of this invention is as follows.

Provide a hardenability constituent useful as the structural seeling material sekad especially for high durability, the sealing material for multipla glass, the moisture seal material used for an electric electronic component, adhesives, etc. from revealing the outstanding intensity and elongation. lave prectical hardenability and stability with e good herdenad materiel obtained

# [Means for Solving the Problem]

catalyst of the (A) ingredient Carboxylic acid calcium, Carboxylic acid vanadium, carboxylic acid iron, carboxylic acid cobalt, and a carboxylic acid zirconium, Securing moderate hardenability and stability t finds out revealing high intensity and the physical properties of high elongation compared with a in order that this invention persons may solve such a problem, as a result of inquiring, as a curing carboxylic acid titanium, carboxylic acid potassium. By using one or more sorts of carboxylic acid metal salt chosen from carboxylic acid barium, carboxylic scid manganese, carboxylic acid nickel, case where octylic acid tin is used as a curing catalyst, and came to complete this invention.

combined with the (A) sillcon atom, and has at least one sillcon content group which can construct a That is, this invantion relates to an organio polymer which hea a hydroxyl group or a hydrolytic basis oridge by forming e alloxane bond, and a hardenability constituent containing (B) carboxylic acid http://www4.ipdl.inpit.go.jp/ogi-bin/tren\_web\_ogi\_ejje?atw\_u=http%3A%2F%2Fw2Fww4.ipdl.i.. 2010/05/06

An amine compound is related with the eforementioned hardonability constituent which becomes as an assential ingredient as a (C) ingredient. As a desirable embodiment, a numbar averaga molecular weight is within the limits of 500-50,000, and an organic polymer of the (A) ingredient is a general formula to an end and/or a side chain of a main chain (1):

Ξ [Formula 1]

respectively. - (R7) respectively — Independent — the absorbtimin of the carbon numbers 1-20, or an unsubstituted hydrocarbon group — it is — it is the Tori ORGANO siloxy group shown. X is a shortycky group or a hydrolytic basis independently, respectively, a is 0, 1, 2, or 3, b is 0, 1, or 2, and a the carbon numbers 6-20, on arallyl group of the carbon numbers 7-20, or (R) 3SIO independently, R and R among a formula) They are an alkyl group of the carbon numbera 1-20, an aryl group of

hardenability constituent given in said cither having one or more hydrolytic silyl groups per molecule and b are not simultaneously set to 0. m -- the integer of 0, or 1-19 -- it is -- it is related with a

t is related with the aforementioned hardenability constituent characterized by X being an alkoxy group as a desirable embodiment. As a desirable embodiment, the organic polymer of the (A) ingredient is related with a hardenability constituent given in said either which is a polyoxyalkylene series polymer and/or a saturated

As a desirable embodiment, said saturated hydrocarbon system polymer is related with the ydrocarbon system polymer.

sforamentioned hardenability constituent which is a polymer having a rapeating unit resulting from sobutylene 50% of the weight or more in a total amount.

pardenability constituent given in said aithar which uses as the main ingredients carboxylic acid metal As a desirable embodiment, a carboxylic acid ziroonium of tha (B) ingredient is related with a salt expressed with a general formula (12).

The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a parbon carbon double bond.) Zr(0) (OCOR) 2 (12)

As a desirable embodiment, carboxylio acid metal sate of the (B) ingradient is related with a hundenshipty constituent prior in said either which is the carboxylio acid metal salt in which the melting notin has an acid radical of carboxylio acid which is 65 sr or less.

As a desirable embodiment, a carbon number in which carboxylic acid metal salt of the (B) ingredient contains carbon of a carbonyl group is related with a hardonability constituent given in said either which is the carboxylic acid metal salt which has an acid radical of carboxylic acid which is 2-17.

nardenability constituant given in said aither which is metal salt of a carboxylic acid group content compound chosen from cotylic acid, 2-ethylhaxanoic acid, nso decanoic acid, oleic acid, or As a desirable embodiment, carboxylic acid metal salt of the (B) ingredient is related with a

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JP,2008-179830,A [DETAILED DESCRIPTION]

naphthenic acid.

quantity which serves as 0.005 - 5 weight section by metallic element conversion contained in the It is related with a hardenebility constituent given in said either containing the (B) ingredient of B) ingredient to (A) ingredient 100 weight section as a desirable embodiment.

(B) ingredient, the (C) ingredient 0.01 - 20 weight sections to (A) ingredient 100 weight section as a It is related with a hardenability constituent given in said either containing the (B) ingredient of quantity which serves as 0.005 – 5 weight section by metallio element conversion contained in the Best Mode of Carrying Out the Invention

Hereafter, this invention is explained in detail.

Restriction in particular does not have a principal chain skeleton of an organic polymer which has a reactive silicon group used for this Invention, and it can use a thing with various kinds of principal 0026

Spacifically A polyoxyathylena, polyoxypropylene, polyoxy butylene, Polyoxy tetramethylen, a

condensation polymerization of epsilon-aminoundecanoio acid, Condensation polymerization is carried out from polyamide system polymer, for example, bisphanol A, and the carbonyl chlorides which have Polysulfide system polymer, Nylon 610 by the condensation polymerization of the nylon 6 by the ring opening polymerization of epsilon caprolactam, hexamethylenediamine, Nylon 66 by the condensation polyisoprene, isoprene or butadiene, acrylonitrile, styrene, atc., Hydrocarbon system polymers, such polyolefine system polymers; Condensation with dibasic acid, such as adipic acid, and glycol, Or the as a hydrogenation polyolefine system polymer produced by hydrogenating polybutadienes or these et two or mora-ingredient ingradient among Nylon 12 by the ring opening polymerization of equilion-tering RAURO lactors, and the above-e-mantioned nylon, such as copolyamide. The polycarbonate system polymer menufactured a dially lighthalase system polymer etc., are illustrated. aster produced by carrying out the radical polymerization of the monomers, such as ethyl acrylate polyester system polymer obtained by the ring opening polymerization of lactone; The polyacrylic and butyl acrylate. Vinyl-base polymers, such as an acrylic ester system copolymer with acrylic ester, such as ethyl aorylate and butyl aorylate, vinyl acetate, acrylonitrile, methyl methacrylate, styrene, etc., A vinyl monomer is polymerized to said organic polymer. Graft polymer, obtained. polyoxypropylena polyoxy butylana copolymar, An ethylene-propylene system copolymer, The polyoxycthylene polyoxypropylene copolymer, Or polyoxyalkylene series polymere, auch as a copolymer of polyisobutylene, isobutylene, isoprene, etc., polychloroprana, A copolymer with polymerization of adipic acid and hexamethylenediamine, and sebacic acid, Nylon 11 by the

chain skeleton, a polyoxyalkylene series polymer, a hydrocarbon system polymer, a polyester system polymer, a vinyl system copolymer, a polycarbonate system polymer, etc. are preferred. A saturated ydrocarbon system polymer, and a polyoxyalkylene series polymer and a vinyl system copolymer Since acquisition and manufacture are easy among polymers with the above-mentioned principal have a comparatively low glass transition temperature, and their hardened material obtained is especially preferred from excelling in cold resistance.

invantion, the reactive silloon group content saturated hydrocarbon system polymer derived from seturated hydrocarbon system polymers, such as polyisobutylene, hydrogenation polybutadiene, and As a saturated hydrocarbon system polymer which has a reactive silicon group used for this nydrogenation polyisoprene, is raised. The reactive allicon group contained in the organic polymer which has a reactive allicon group is a basis which can construct a bridge by formation of the allocane boat which the areactive which the allocane boats which the allocane boats of the phycoxy group or hydrohyto basis combined with the silicon aron, and is accelerated with the

carboxylic acid metal salt which is the (B) ingredient.

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JP,2008-179830,A [DETAILED DESCRIPTION]

As a reactive silicon group, it is a general formula (1). :

H'24) H'24 4-0-8-X Formula 2] [0032]

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he carbon numbers 6-20, an aralkyl group of the carbon numbers 7-20, or (R') 3SiO independently, R¹ and R² among a formula) They are an alkyl group of the carbon numbers 1-20, an aryl group of espectively. - (R') respectively --- independent --- substitution of the carbon numbers 1-20, or an insubstituted hydrocarbon group — It is — it is the Tori ORGANO siloxy group shown. X is a

hydroxyl group or a hydrolytic basis independently, respectively, a is 0, 1, 2, or 3, b is 0, 1, or 2, and a and b are not simultaneously set to 0, m — an integer of 0, or 1–19 — it is — a basis expressed is

t is not limited but what is necessary is just a conventionally publicly known hydrolytic basis

an acyloxy group, a KETOKISHI mate group, an amino group, an amide group, an acid-amide group, an aminoxy group, a sulfhydryl group, an alkenyloxy group, etc. are generally used concrete, for example sspecially as a hydrolytic basis. A besia for which a hydrogen atom, a halogen atom, an alkoxy group,

Among these, atthough an alkoxy group, an amide group, and an aminooxy group are preferred, a point of hydrolysis nature being quiet and being easy to deal with it to especially an alkoxy group is

A hydrolytic basis and a hydroxyl group can be combined with one silicon atom in the 1-3 ranges, and (a+sigmab) has 1-5 preferred ranges. When a hydrolytic basis and a hydroxyl group join together in

Although a silicon atom which forms a reactive silicon group is one or more pieces, in the case of a two or more ] a reactive silicon group, they may be the same and may differ.

allicon atom connected by siloxane bond etc., it is preferred that they are 20 or less pieces.

In particular, it is a general formula (13). :

Formula 3

ethoxy basis, a propoxy group, and an isopropoxy group, is mentioned for X as an example in case o is 3, In the above-mentioned general formula (13), as an example of  $\mathbb{R}^2$  in case c is not 3, For example, oyolosiliyi groups, such as alkyi groups, such as a methyl group and an ethyl group, and a oyolohaxyl group, Araikyi groups, such as aryl groups, such as a phenyl group, and benzyl, the Tori ORGANO n the above-mentioned general formula (13), Tori alkoxy silyl groups, such as a methoxy group, an (R<sup>2</sup> and X are the same as the above among a formula.) c is an integer of 1-3. Since the reactive silicon group expressed is easy to receive, it is preferred.

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slloxy group R' is indicated to ba by 3SIO- which is a methyl group, a phenyl group, etc. (R'), etc. are nentioned. In these, the point that the activity of a hydrolyais reaction is high to espacially a methyl group is preferrad.

disopropoxy methyl silyl group are mentioned. Its activity is high, and since especially the trimethoxysilyl group can reduce quantity of carboxylic acid metal salt which is the (B) ingredient, it is group, a trisopropoxy sliyl group, a dimethoxymethyl sllyl group, a diethoxymethylsllyl group, and a As more concrete illustration of a reactive silicon group, a trimethoxysily| group, a triethoxy sily|

What is necessary is just to perform introduction of a reactive silicon group by a publicly known method. That is, the following methods are mentioned, for example.

unsaturation group content organicity polymor is obtained by copolymerization with an unsaturation group content epoxy compound. Subsequently, hydrosliane which has a reactive silion group is made to this functional group react, and obtain an organic polymer containing an unsaturation group. Or an reactivity to an organic polymer which has functional groups, such as a hydroxyl group, in a molecule b) Make an organic compound which has an active group and an unsaturation group which show

\*\*) Make a compound which has a sulfhydryl group and a reactive silicon group react to an organic olymer containing an unsaturation group produced by making it be the same as that of the (b)

to act on an acquired resultant, and it hydrosilylates.

reactivity to an organic polymer which has functional groups, such as a hydroxyl group, an epoxy \*\*) Make a compound which has a functional group and a reactive silicon group which show group, and an isocyanate group, in a molecule to this functional group react.

group which have a hydroxyl group react to an end a method of (b) or among (\*\*)s from points, like a A method of making a compound which has a polymer, an isocyanate group, and a reactive silicon manufacturing cost becomes low in the above method is preferred.

(b) As an example of a hydrosilane compound used in a method, For example, tricklorosilane, methyldi chlorosilicane, dimethylchlorosilioane, Halogenation Silang like phenyl dichlorosilane; Trimethoxysilane, Triethoxysilane, methyldiethoxyailsna, methyl dimethoxysilane, The alkoxysilane like phenyl [0048]

the KETOKISH mate silenes like bist(dimethyl KETOKISHI mate)methylailene and bis(cyclohoxol) RETOKISHI mate)methylailene sied is in eine limited to the same. Amore the challegreichen Silineg and alkocyaliene are especialisty preferred from points, like availability and hydrokysis readon neture. dimethoxyeilane; Methyldi acctoxysilane, The acyloxy silanea like a phenyldiacctoxysilane; although are high

example, etc. are mentioned, it is not limited in particular. As an example of a compound of having radical addition reaction under a radical initiator and/or radical source-of-release existence, for compound which has a sulfhydryl group and a reactive silicon group as a synthetic method by a \*\*) Although a method of introducing into an unsaturation binding site of an organic polymer a

tricthoxysilane, gamma-mercapto propylmethyl diethoxysilane, etc. are raised, it is not limited to said sulfhydryl group and a reactive silicon group. For example, although gamma-mercapto propyltrinethoxysilane, gamma-mercaptopropyl propyltrinethoxysilane, gamma-mercaptopropyl

method of making a compound which has a polymer, an isocysnete group, and a reactive silicon group particular. As an example of a compound of having said isocysnete group and a reactive silicon group, \*\*) Although a method etc. which are shown in JP,H3-47825,A are mentioned, for example as a which have a hydroxyl group reacting to an end among synthetic methods, it is not limited in

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For example, although gamma-isocyanate propyltrimethoxysllane, gamma-isocyanate propylmethyl

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liethoxysilane, etc. are raised, It is not limited to these.

As for a silane compound which three hydrolytic bases have combined with one silicon atoma, auch as trimethoxysilane, diaproportionation may advance. If disproportionstion progresses, a remarkable langerous compound [ like ] which is dimethoxyailane will arise. However, such disproportionation

propyltrimethoxysilane. For this reason, when three hydrolytic bases, such as a trimethoxysilyl group, ise a basis combined with one silicon atom as a silicon content group, it is preferred to use a dvances in neither gamma-mercapto propyltrimethoxysilane nor gamma-isocyanate

(A) A number average molecular weight of an organic polymer which is an ingredient. In polystyrene conversion in GPC (genmeation notmontargently, it is preferred that it is 500 to about 50000, and about 1,000 to 30,000 isquefied thing which is, carries out and has mobility is especially preferred from about 1,000 to 30,000 isquefied thing which is, carries out and has mobility is especially preferred from synthetic method of (\*\*) or (\*\*).

exceeded when a number average molecular weight is less than 500, since it is lacking in mobility and coints, such as the ease of dealing with it. If sufficient rubber elasticity is not obtained and 50,000 is pandling is difficult for it, at ordinary temperature, it is not desirable.

not no longer be obtained, if the number of reactive silicon groups contained in a molecule will be less (A) A reactive silicon group in one molecule of organio polymers which are an ingredient is one or more pieces, and it is preferred that there are 1.1-5 pieces. Since it will become weak firmly and will become scarce at rubber elasticity if hardenability becomes insufficient, good rubbar elasticity may than one piece, and five pieces are exceeded, it is not desirable.

may be in both. Since effective network chain density of an organic polymer component contained in a hardened material formed eventually increases especially when a reactive silicon group is in a main chain terminal, it is desirable from points, like a rubber-like hardened material of high elongation A reactive silicon group may be in a main chain terminal or a side chain of an organic polymer, and

becomes is easy to be obtained with high intensity.

Said polyoxyalkylene series polymer is a general formula intrinsically (14).:

Formula 4]

-R<sup>3</sup>-0- (14)

alkylene group of the carbon numbers 1-14) --- it being a polymer which has a repeating unit shown. and, R3 in a general formula (14) has the carbon numbers 1-14, and also preferred straight chain smong a formula, R3 is a divalent organic group and is the straight chain shape or the branching shape or branched state alkylene group of 2-4. As the example of the repeating unit shown by a

reneral formula (14). Formula 5]

\*\* is mentioned. The principal chain aksiston of a polyoxyalkylena series polymer may consist of ons

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kind of repeating unit, and may consist of two or more kinds of repeating units. When used especially for sealant ato, it is desirable from that what comprises the polymor which uses a polyoxypropylene system polymer as the main ingredients is amorphous, or the point which is hypoviscosity

which are shown in JP.61-215623.A react, JP.46-27250.B, JP.59-15339.B, a U.S. Pat. No. 3278457 tem, a U.S. Pat. No. 3278458 item, A U.S. Pat. No. 3278459 item, a U.S. Pat. No. 3427256 item, a U.S. As a synthetic method of a polyoxyalkylene series polymer. For exampla, the polymerizing method by shown in a U.S. Pat. No. 3427335 item etc., \*\*\*\*\*\*\*\*\*\*\*\* such as the polymerizing method using a complex catalyst like a complex produced by making an organoaluminium compound and porphyrin Pat. No. 3427334 item. The polymerizing method by a composite metal cyanide complex catalyst colymerizing method using a catalyst which consists of a phosphazene compound illustrated by an alkali catalyst like KOH, the polymerizing method by a transition metal compound-porphyrin catalyst which consists of a polyphosphazene salt illustrated by JP,H10-273512,A, and the

n a principal chain skeleton of the above-mentioned polyoxyalkylene series polymer, other

JP,H11-060722,A, are not limited in particular.

ingredients, such as a urethane bond ingredient, may be included in the ranga which does not spoil an effect of this invention greatly.

oompounds, such as allphatic series system polyisooyanates, such as hexamethylene di-isooyanate, and polyol which has a repeating unit of the above-mentioned general formula (14) can be mentioned tolylene diisooyanate, Aromatic system polyisooyanates, such as diphenylmethsne diisooyanate and cylylene diisocyanate; Isophorone diisocyanate, What is obtained from a resetion of polyisocyanate It is not limited especially as the above-mentioned urathans bond ingredient, but For example,

JP.57-164123.A, JP.3-2450.B, a U.S. Pat. No. 3632557 item. What is proposed by each gazette, such as a U.S. Pat. No. 4345053 item, a U.S. Pat. No. 4345053 item, a U.S. Pat. No. 4345084 item. A manufacturing method of a polyoxyalkylene series polymer which has a reactive silicon group, JP,45-36319.B. JP,46-12154.B. JP,50-156599.A. JP,54-6096,A. JP,55-13767.A. JP,56-13468.A.

JP,61-197631.A, JP,61-215622.A, JP,61-215623.A, JP,61-218632.A, JP,H3-72527.A, JP,H3-47825.A. molecular weights and Miv/Mi (ratio of weight average molecular weight and a number average molecular weight has use conveniently a polosyalikyhan earlies polymer with narrow molecular weight has not see mounted to be a seen and the payment of bolymer Division, it is not limited to in parfectled weight distribution in the 18 or less amount of Polymer Division, it is not limited to in parfectled to the part of Although it is indicated by each gazette of JP,H8-231707,A and 6,000 or more number average

A polyoxyalkylene series polymer which has the above-mantioned reactive silicon group may be used alone, and may be used together two or more sorts.

polymer tend to introduce a functional group into an end, and tend to control a molecular weight and such as ethylene, propylene, 1-butene, and isobutylene, is polymerized as the main ingredients, and  $\mathbb I$ A polymer which makes a skeleton of a saturated hydrocarbon system polymer which has a reactive silicon group used for this invention. (1). [ whether an olefinic compound of the carbon numbers 1-6. hydrogenating but. Since an isobutylene system polymer and a hydrogenation polybutadiene system After making diene series, such as butadiene and isoprene, homopolymerize or carrying out. copolymerization to the above-mentioned clefinic compound, can obtain by a method of can increase the number of end functional groups, they are preferred

lass % of the weight still more preferably 50 or loss % of the weight. In an isobutylene system polymer when content of a monomeric unit which has isobutylane and copolymeric exceeds 50 % of the All the monomeric units may be formed from an isobutylene unit, and an isobutylene system polymer, It is [ in an isobutylene system polymer ] desirable, and s monomeric unit which has isobutylene and copolymeric may be aspecially contained in 10 or less % of the weight of the range prafarably 30 or 9900

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veight, since characteriatic physical properties, such as high weatherability, high heat resistance, low

noisture permeability, etc. resulting from an isobutylene skeleton, are not fully revealed, it is not

As such a monomer component, an olefin of the carbon numbers 4-12, vinyl ether, an aromatio vinyl compound, vinyletiene, and aryisilane are raised, for example. As such a copolymer component, for xample 1-butene, 2-butene. A 2-methyl-1-butene, a 3-methyl-1-butene, a pentene, 4-methyl-1pentene, A hexene, a vinyloyclohexene, the methyl vinyl ether, ethyl vinyl ether. Isobutylvinyl ether, tyrene, sipha-methylstyrene, dimethylstyrene, Monochlorostyrene, dichlorostyrene, beta-pinene,

ndene, vinyi trichlorosilane, Vinyi methyidi chlorosilicane, vinyidimethyichlorosilicane, inyidimethyimethoxysilane, Vinyi trimethyisilane, divinyi dichlorosilane, divinyi dimethoxysilane, Divinyi allyidimethyl methoxysilane, allyi trimethylsilane, diaryl dichlorosilane, dieryl dimethoxysilene, diaryl limethylsilane, gamma-methacryloyl oxypropyl trimethoxysilane, gamma-methacryloyl oxypropyl simethylsilane, the 1.3-divinyl- 1, 1, and 3, 3-tetramethyl disloxane, TORIBI nil methylsilane, a etravinyl silane, ellytrichlorosilane, Allyl methyldi chlorosilicane, allyldimethylchlorosilicane,

As a monomeric unit which has isobutylene and copolymeric among the above, if vinyisilane and arylaitene are used, a basis which silicon content increases and can act as a silans coupling agent will ncrease, and the adheave property of a constituent obtained will improve.

nethyl dimethoxysilane etc. are raised,

ngredients like a case of the above-mentioned isobutylene system polymer in a hydrogenation Other monomeric units may be made to contain besides a monomaric unit used as the main polybutadiene system polymer or other saturated hydrocarbon system polymers.

compounds, such as butadiene and isoprene, remains in the range in which the purpose of this to a saturated hydrocarbon system polymer which has e reactive silicon group used for this invention. A little monomeric units in which an after-polymerization double bond like polyene

invention is attained may be made to contain in 1 or less % of the weight of the range preferably especially 5 or less % of the weight still more preferably 10 or less % of the weight.

A saturated hydrocarbon system polymer which has these reactive silloon groups can be independent, or can be used together two or more sorts. 0071

A process of e saturated hydrocarbon system polymer which has a reactive silicon group next is 0072

An isobutylene system polymer which has a reactive ailicon group in molecular chain terminals among combining and [which is called inpho!] and a chain transfer agent) called inphor method—it can manufacture preferably using a whole and organic-functions type isobutylene system polymer. As a process of a saturated hydrocarbon system polymer which has a reactive silicon group. For example, general formula (15) after obtaining polyisobutylene which has an unsaturation group at the end by obtained by the polymerizing method (cationic polymerization method using a spacific compound isobutylene system polymers which have a reactive silicon group, an end organic-functions type combination obtained by a polymerization reaction, the reaction of an end of a polymer and ellyl dehydrohalogenation reaction of an end of a polymer which has third class carbon-chlorine trimethylsilane which have third class carbon-chlorine combination, etc. :

(1 2)

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JP.2008-179830,A [DETAILED DESCRIPTION]

 $\{R^i,R^2,\chi,m,a,$  and b are the same as the above among a formula.) — the hydroaliane compound (this compound is a compound which the hydrogen atom combined with the basis expressed with a

general formule (1),) expressed — desirable — general formula (16): Formule 7]

(R<sup>2</sup>, X, and c are the same as the above among a formula.) — it can obtain by the reaction (hydrosinylation reaction) to which the hydrosilane compound expressed is made to add using a

4s a hydrosilene compound, for example Triohlorosilane, methyldi chlorosilicana, Halogenation Silang platinum catalyst.

acetoxyallene, The ecyloxy silanes like a phenydiecetoxyallane; athough the KETOKISHI mate silanes like bis(dimethyl KETOKISHI mete)methylallane are like bis(dimethyl KETOKISHI mete)methylallane are like dinethylchlorosilioane and phenyl dichlorosilane. Trincthoxysilane, Triethoxysilane, methyldiethoxysilane, methyl dimethoxysilane. The alkoxysilane like phanyl dimethoxysilane. Methyldi raised, it is not limited to these. Among these, halogenation Silang and alkoxysilane are preferred

Such a manufacturing method is indicated in each gazotto of JP.4-69659,B, JP.7-108928,B, JP.63-254149,A, JP.64-22904.A, and the patent No. 2539445, for example.

aspecially in respect of the ease of acquisition, etc.

manufactured by adding and cerrying out copolymerization of the vinylsilane and arylsilene which have An isobutylene system polymer which has a reactive silicon group in a chain side chain is a reactive silicon group into a monomer containing isobutylene.

vinybaliane and enylatine etc. which have a reactive sillicon group in addition to an isoburbidene momente which is the team in agradient, an isoburbidene system potenter which has a reactive sillicon group in an end and et alian iside chân is menulicatured by introducing a reactive alicon group into an expense and an expense and a support of the control of the c In the case of a polymerization reaction which manufactures an isobutylene system polymer which has a reactive silicon group in molecular chain terminels. After carrying out copolymerization of the

As the vinyisilane which has a reactive silicon group, and aryisilane, For example, vinyi trichlorosilane, vinyl methyldi chlorosilloane, vinyldimethylchlorosilicane, Vinyldimethylmethoxysilane, divinyl dichlorosilane, divinyl dimethoxysilane. Allyltrichlorosilane, allyl methyldi chlorosilicane.

alydimethylchlorosilicane, Allydimethyl methoxysilane, daryl dichlorosilane, diaryl dimethoxysilane. gamma-methacryloyl oxypropyl trimethoxysilane, gamma-methacryloyl oxypropyl methyl in this invention, a hydrogenation polybutadiene polymerization object which has a reactive silicon group can be mentioned as a saturated hydrocarbon system polymer which has a reactive silicon dimethoxysilane, etc. are raised.

acquired by the hydrosilylation reaction of a hydrogenation polybutadiene polymerization object which nea an end olefin group uses a hydroxyl group of an end hydroxy hydrogenation polybutadiene system polymer as oxy metal groups, such as —ONa and —O.K., first, for exemple : group. A hydrogenation polybutadiene polymerization object which has a reactive silicon group can be has an olefin group. General formula (17) after a hydrogenation polybutadiene system polymer which

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hydrocarbon group of the carbon numbers 1-10) being preferred] react. [0084]

As a method of using terminal hydroxyl groups of an end hydroxyh hydrogenatron polybutadiene septem polymer over yor meta groun, A method of making it react to alkaline-water oxides, auch ass Na. meta alkomet as an overal inydride/NAOH8 like alkaline metalihlari like it, and KOH, etc. is Although an end defen by despending no holystudiation go stem no hours with the instance aroun moderator would be an end by their of hypogenical no holystudiation system polymer used as a starting material is advantaged to the starting material is advantaged to the starting material is advantaged to the material to forgonical compound of a general formatio (17) resert to clearly a polymer Distain man, at the three, not as a methopien noticed is a polymer of the amount of the power Distain man, at the three, not as a methopien noticed is a polymer of the amount of the power Distain man, at the three, to as the same method halogeness compound which contains two or more balogen in one molecule, and is allown by a general frame (17) that is the power power molecule, and is allown by a general frame (17) that is the contains two or more balogen in one molecule, and is allown by a general frame (17) that is the contains power that the contains produce and as a system polymer, which is the amount of Polymer Division more, and has an orbital good at each can do no obtain group at the end can be obtained.

As an example of no organic hologousts commoned shown by and grewell formula (17). For example, and shocked, and and a star is placed commoned by the beams. Although said (otherwardsy) beams. All killing the star is placed, and all killing the star is the star is all killing the star is the star is all killing the st

cossy, i.e. scenesore. [0083] Introduction of a reactive silicon group to said end olefin hydrogenation polybutadiene system

Introduction of a machive alictor group to said and defin inductation to polymer matching spatial polymer and polymer among the party of said and addition resident using a platform system cetabytt in an indystreilance compound file a case of an isobudydene system polymer which has a reachive silicon crous in molecular chain terminals.

as earbraid proportion spart measurement as earbraid measurement and assert medical measurement of a medical shown of the control substantially as unsaturated bond which is not to a result of a medical shown of the control substantially as unsaturated bond which is not to a result of the a medical state of the control or control of a south of the control of a medical state not being the control of the contro

In organic polymer which has these reactive alloson groups may be used alone and may be used when the third in the property of the property polymer when the property polymer between the property allowing group, a submediated hydrocation is valent polymer which has a reactive allong group, a with that the property of the property polymer which has a reactive allong group, and why that does not group, as and others, can also be used.

young a financiating method of an organio polymer which blends a polyoxyalkylene series polymer which has a reactive alloon group, Although has a reactive alloon group, Although and a reactive alloon group, Although andiaced by 1959-125641A, UP 839-112642A, UP.HE-172631A, UP.HI-116763A, etc., it is not minimat by a particular these.

[0091] A desirable example has a reactive silicon group and a chain is a following general formula

substantially (18). : [0092] nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran\_wcb\_cgi\_ejje?atw\_u=http%3A%2F%2Fwww4.ipdl... 2010/05/06

JP.2008-179830.A [DETAILED DESCRIPTION]

the acrytic eater monomer unit which has an alkyl group of the carbon numbers 1–8 expressed with (a hydrogen atom or a methyl group, and R? Handw has lakyl group of the carbon numbers 1–8 among a formula as for R?) (meta-), and following general formula (19):

... the inside of a formula, and R<sup>9</sup> — the above — the same — R<sup>8</sup> shows a with a carbon numbars

of the rin one all (group —)— it is coolphine which constant of an examiner unit which has a with a calchon number of the or among expressed alloy (group (meta-)). It is the method of benefing and menufacturing the polycoyallylene series polymer which has a reactive allono group Acolys bad (meta) appresses sorple sed end/or methosorple assorphine in a constitution of appressive from.

Lovania.

10 rigid general formula (18) — the carbon numbers 1-8 of a methyl group, an ethyl group, a propyl group, re-burlyl group, 2-burlyl group, 2-burlyl

[0097]

87 of said general formula (19) — ten or more carbon numbers of a lauryl group, a trisleoyl group, a serving general formula (19) — ten or more carbo annumbers of a laurg-chiain slayl group of carbo group, a stateny group, a belienyl group, etc. — usualily — 10-50 — a laurg-chiain slayl group of

(10–20 is raised preferably. Like a case of Pt<sup>2</sup>, an alkyl group of R<sup>2</sup> may be independent and may be benefit to a more acrea. [10989]
[10989]
[10089] and the index of the great cooperation of the cooperation of a formula (18) and a formula (18) substantible, a "cell barrier" have masser that the sum fosted of a formula of the formula (19) substantible, a "cell barrier" have masser that the sum fosted of a motioner on that of a formula (19) substantible, a "cell barrier" and a formula (19) supplies a formula (19) supplies a formula (19) supplies and the formula (19) supplies and the formula (19) in 10 % of the weight or more total of a monomeric unit of a formula (10) and a formula (19) in 10 % of the weight or more.

From a point of compatibility with a polycovalk/dene acries polymen; as for an abundance ratio of a monomeriou to it of comput (18) and a monomerio unit of a formula (18) 55.5—40.50 are preferred at a weight ratio, and 95(10-90.90) are attli more perferred.

As monomentic units other than a formula (18) which may be centrained in thit copolymer, and a formula (18). For example, extroving one for groups, such as a conference are sortle acid and muthursylo acid, an explained, Amile groups, such as metha-orizanide. Himstryklebs-opismide, and N-mathykolmethacrylamide, Epory groups, such as glyicidyl acrystee and glyicidyl methacrylamide.

Dichtplannie obth jarspitz, dichtplanne obth metherspitz, A mnonner outsining annie geups, and an amineethyl vinyl citera: a monomerie unit wideh oliginata in anylointile; styreas, abbamethyldersm, alsely vinyl citer; a monomerie unit wideh oliginata in anylointile; styreas, abbane this is raised. http://www4.ipdl.inpit.go.jp/ogi-bin/tran\_web\_cgi\_cjje?atw\_u=http%3A%2F%2Fwww4.ipdl.i.. 2010/05/06

as a reactive silicon group, and a vinyl-base polymer which has a reactive silicon group is indicated Although an organic polymer which blends a saturated hydrocarbon aystem aystam polymer which by JP,H1-168764,A, JP.2000-186176,A, etc., it is not limited to in particular these. A method of polymerizing an acrylic ester (meta) system monomer elsewhere under existence of an nganic polymer which has a reactive silicon group as a manufacturing method of an organic polymer which blends a vinyl-base polymer which has a reactive silicon group can be used. Although this nanufacturing method is concretely indicated by each gazette, such as JP,59-78223,A, JP,59-

168014,A, JP.60-228516,A, and JP,60-228517,A, it is not limited to these.

One or more sorts of carboxylic acid metal salt chosen from carboxylic acid barium, carboxylic acid Sarboxylic acid vanadium, carboxylic acid iron, carboxylic acid titanium, carboxylic acid potassium, Sarboxylic soid calcium used as a (B) ingredient in a hardenability constituent of this invention.

nanganese, carboxylio acid nickel, carboxylic acid cobalt, and a carboxylic acid zirconium, It functions as what is called a silanol condensation catalyst in which a siloxane bond may be made to form from a hydroxyl group combined with a silicon atom contained in an organic polymer which is the (A) ngredient of this invention, or a hydrolytic basis.

n said carboxylic acid metal salt, carboxylic acid calcium, carboxylic acid vanadium, Carboxylic acid ron, carboxylic acid titanium, carboxylic acid potassium, carboxylic acid barium, carboxylic acid

patalyst is high, carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid iron, carboxylic acid nanganese, and a carboxylic acid zirconium, It is more desirable from a point that the activity of a bitanium, and a carboxylic acid zirconium are still more preferred, and carboxylic acid iron and carboxylic acid titanium are especially the most preferred.

potassium, carboxylic acid barium, carboxylic acid manganese, carboxylic acid nickel, carboxylic acid cobalt, and a carboxylic soid zirconium, it is more desirable from a point with little coloring of a Carboxylic soid calcium, carboxylic soid vanadium, carboxylic soid titanium, Carboxylic soid

hardenability constituent obtained, and point that the heat resistance of a hardened material and weatherability which are obtained are high and entropylis acid acidium, carboxylis acid transium, entropylis acid patessum, carboxylis acid barium, and a emboxylis acid strontium are still more

referred.

This (B) ingredient uses as the main ingredients carboxylic acid metal salt expressed with general ormula (2) - (12), respectively.

3a(OCOR) 2 (2)

Fe(000R) 2 (4) /(OCOR) 3 (3)

(OCOR) 4 (6) ((OCOR) (7)

56(OCOR) 3 (S)

nickel(OCOR) 2 (10) 3a(OCOR) 2 (8) Mn(OCOR), (9)

Zr(O) (OCOR), (12) Co(OCOR) 2 (11)

The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a As carboxylis acid, a carboxylic acid group content compound of a Indrocarbon system of 2-40 is acid activity, and a carbon number including carbonyl carbons are by be specially used for a surboxylis acid group content compound of a hydrocarbon system of the scribon numbers 2-20. carbon carbon double bond,)

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JP.2008-179830.A [DETAILED DESCRIPTION]

suitably from a point of availability here.

Enanthio aoid, capryllo aold, 2-ethylhexanoio acid, palargonio acid, caprio acid, Undecanoio acid, leurio scid, Tsuzuic acid, FIZETERIN acid, myristoleic acid, 2-hexadecenoic acid, 6-hexadecenoic acid, 7-Vhen it illustrates concretely, acetic sold, propionic acid, butancic acid, a valeric acid, caproic acid nonadecanoio acid, arachin acid, Behenic ecid, lignocaric acid, cerinic acid, montanic acid, melisaic told, Straight chain saturated fatty acid groups, such as RAKUSERU acid; Undecylenic acid, Linder acid, tridacylacid, myristic acid, pentadecyl acid, Pulmitic acid, heptadecylacid, stearic acid,

hexadecenoic acid, palmitoleic acid, a petrosclinic acid, Monoene unsaturations, such as oleic acid.

8,12,16,19-docosatetraenoic acid, 4,8,12,15,18-cicosapentacnoic acid, Polyene unsaturated fatty acid, olcosteario acid, punicio acid, linolenic acid, 8,11,14-eicosatricnoic acid, a 7,10,13-docosatricnoic acid with triple bonds, such as ateer roll sold, a oreponynic sold, KISHIMENIN sold, and 7-hexa crepe-de-Ohine acid, Naphthenic sold, A malvalic sold, sterculic sold, HIDONO carbyna sold, chaulmoogrio sold. such as olupanodonic acid, herring acid, and docosahexacnoic acid; Iso acid, Branch fatty acid, such as anteiso acid, tuberculostearic acid, a pivalic acid, and neo decanolo acid, A tariric acid, Fatty acid slaidio acid, ASUKUREPIN acid, vaccenic acid, gadolcic acid, Gondo Inn acid, a cetoleic acid, eruclo Alloyolic carvone acide, such as gorlic scid; Sabinic scid, 2-hydroxytetradosandic acid, IPUNORU acid, 2-hydroxyhexadosanoic acid, YARAPI Norian acid, uni-PERIN acid, AMBURETTORU acid, atty sold; Linolic sold, 10,12-octsdecadionoic sold, HIRAGO sold. Alpha-eleostearic sold, beta-1.8,11,14-hexadeca tetraenoic acid, MOROKUCHI acid, steer RIDON acid, Arachidonic acid, ARYURITTO acid, 2-hydroxyoctadecanoic acid, 12-hydroxyoctadecanoic acid, 18acid, brassidic acid, selacholeic acid, KISHIMEN acid, and RUMEKUEN acid

recinoleic soid, cam ROREN soid, licanic soid, ferron soid, and cerebronic soid; dicarboxylic soid, such as succinic soid, glutaric soid, adipio soid, pimelic soid, SUPERIN soid, szelsic soid, and sebacic soid, nydroxyoctadecanoic acid, 9,10-dihydroxyoctadecanolc acid, Oxyganatad fatty acid, such as

that it is 65 \*\* or less, it is more preferred that it is -50-50 \*\*, and it is preferred that it is especially when the melting point of said carboxylic acid is high (orystallinity is high), the melting point becomes radical (workability — bad). Therefore, as for the melting point of said carboxylic acid, it is preferred high in a similar manner, and it is hard to deal with carboxylic acid metal salt which has the acid

solid state or viscosity and which is hard to deal with it (worksbility -- bad). On the contrary, when a iquefied and carboxylic acid metal saft which has the soid radical becomes a thing which has a high oarbon number of said carboxylic acid is small (a molecular weight is small), catalyst ability of carboxylic scid matal salt may fall [ carboxylic acid metal salt which has the soid radical ], including extended a constituent thinly, volatilization by heating may be large and catalyst ability of carboxylic nostly an ingredient which volatilizes easily with heating. Especially on conditions (thin layer) which when a carbon number of said carboxylic acid is large (a molecular weight is large), it becomes

good to said carboxylic acid has 2-ethylhexanoic acid, octylic acid, neo decanoic acid, oleic acid, or preferred naphthenic acid. Said naphthenic acid. Said naphthenic acid. Especially acquisition is easy, and is cheap and a point that compatibility with the (A) ingredient is

numbers including carbon of a carbonyl group are 2-17, it is more preferred that it is 3-13, and it is

preferred that it is especially 5-10.

soid metal salt may fall greatly. Therefore, as for said carboxylic acid, it is preferred that carbon

carboxylic soid (2-ethylhoxanoic soid etc.) whose carbon stoms in which said carboxylic soid adjoins quaternary carbon A pivalic acid etc. are more preferred from a cure rate being quick, and especially carboxylic acid whose carbon atom which adjoins a carbonyl group is quaternary carbon is preferred. a carbonyl group are the third class carbon and carboxylic acid (neo decanoic acid.) which is

from a viewpoint of availability and compatibility, as an exampla of desirable carboxylio sold metal saft, 2-ethylisexanoic soid iron (divalent), 2-ethylisexanoic soid

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obalt (divalent), 2-ethylhexanoic sold zirconium (tetravalence), neo decanoic sold iron (divalent). Neo othylhexanoio acid manganese (divalent). 2-ethylhexanoio acid nickel (divalent), 2-ethylhexanoic acid tacanoic acid iron (trivalent), neo decanoic acid titanium (tetravalence), nao decanoic acid vanadium divalant), 2-ethylhoxanoio aold potassium (univalent), 2-ethylhexanoic acid barium (divalent), 2itanium (tetravalence), 2-athylhexanoic acid vanadium (trivalent), 2-ethylhexanoic acid calcium

trivalent), neo decanoio aoid caloium (divalent), neo decanoio aoid potasaium (univalent), neo

divolent), naphthenic acid potassium (univalent), naphthenic acid barlum (divalent), manganese naphthenic to the naphthenic acid inickel (divalent), a naphthenic ranadium (trivalent), oleic acid calcium (divalent), oleic acid potassium (univalent). Oleic acid barium (divalent), manganaso oloato (divalant), oleic acid niokel (divalent). Oleic acid cobalt (divalent), an oleic acid zirconium (tetravalence), naphthenic acid iron (divalent), Naphthenic acid iron (trivalent). saphthenic acid titanium (tetravalence), naphthonic acid vanadium (trivalent), Calcium naphthonate decanoic acid barium (divalent), a neo decanoic acid zirconium (tetravalence) Oleic acid iron (divalent), oleic acid iron (trivalent), oleic acid titanium (tetravalence). Oleic acid

2-ethylhexanoio acid iron (divalent) from a viewpoint of oatalytic activity, 2-ethylhexanoic acid iron (trivalent), 2-ethylhexanoic acid titanium (tetravalence), neo decanoic acid iron (divalent), Neo

soid zirgonium (tetravalence), etc. are mentioned.

2-cthylhexanoic acid iron (trivalent), nco decanoic acid iron (trivalent), oleic acid iron (trivalent), and Naphthenic soid iron (trivalent) and naphthenic soid titanium (tetravalencs) are more preferred, and decanoic acid iron (trivalent), nec decanoic acid titanium (tetravalenca), cleic acid iron (divalent), Dicio acid iron (trivalant), claic acid titanium (tetravalence), naphthanic acid iron (divalent),

especially naphthenic acid iron (trivalent) are preferred. 0113

calcium (divalent), 2-cthylhexanoic acid potassium (univalent). 2-ethylhexanoic acid barium (divalent). From a vicwpoint of coloring to 2-ethylhexanoic scid titanium (tetravalence). 2-ethylhexanoic acid !-ethylhexanoic acid zirconium (tetravalence), Neo decanoic acid titanium (tetravalence), neo

divalent), a neo decanoic acid zirconium (tetravalence), Ofeic acid titanium (tetravalence), oleic acid lecanoio acid calcium (divalent). Neo decanoio acid potassium (univalent), neo decanoio acid barium iroonium (tetravalence), naphthenic acid titanium (tetravalence), calcium naphthenate (divalent), naphthenic acid potassium (univalent), naphthenic acid barium (divalent), and a naphthenic acid saloium (divalent), oleic acid potassium (univalent), Oleic acid barium (divalent), an oleic acid tirgonium (tetravalence) are more preferred.

method to which a carboxylic acid group content compound and metal powder are made to react, ] an sodium hydroxide react, and makes solution of hard acap, Solution of metal sait prapared apart from this in addition, a sedimentation method which settles metallic sosp, A carboxylic soid group content compound or its ester and mataled hydroxide, an oxide, A mathod etc. to which an alcoholate or a Such carboxylio acid metal salt makas a carboxylio acid group contant compound, or its ester and chloride, and a carboxylio acid group contant compound are made to react in [ else /, such as scorification to which a weak acid salt is made to react at an elevated temperature, and direct anhydrous organic solvent are taken.

As for such carboxylic acid metal salt, it is preferred to dilute with diluting solvents, such as a mineral spirit, toblane, hexplores glycol, a diethylene glycol, a paraffin oil, and diethyl phthalise, and to be used with gestalk of a solution whose metal content is about 1 to 40 % of the weight. 0115

desirable. On the other hand, pot life becomes short too much and is not preferred from a soint of workable, because the state of behavior of soint of workable people and soint soil workable people and the single pot little and behavior boat the time of the little of handoning arise, and is land to be obtained, if beadings of this (3) introdient exceed this (B) About 0.005-5 weight sections are preferred at metallic element conversion contained in the (B) weight sections are preferred. (B) Since a cure rate may become slow and a hardening reaction will ingredient to (A) ingredient 100 weight section as amount of ingredient used, and also about 0.01-3 become fully difficult to advanca if loadings of an ingredient are less than this range, it is not

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JP.2008-179830,A [DETAILED DESCRIPTION]

using it alone, it can be used combining two or more sorts, and also can use together with carboxylic manganese, carboxylic acid nickal, carboxylic acid cobalt, and a carboxylic acid ziroonium. Besides acid tin salt, carboxylic soid lead salt, carboxytic soid bismuth aalt, carboxylic acid cerio salt, etc. Carboxylic acid titanium, carboxylic acid potassium, carboxylic acid barium, carboxylic acid The aforementioned carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid iron.

xample, Specifically Methylamine, ethylamine, propylamine, isopropylamine, A butylamine, amyl amine, On the other hand, only with carboxylic acid metal salt of the (B) ingredient, activity is low, and when moderate hardenability is not acquired, various amine compounds which are the (C) ingredients as a hexylamine, octylamine, 2-ethylhexylamine, Nonyl amine. decyl amine, lauryl amine, pentadeoyl amine. og-catalyst can be added. As various amine compounds, although indicated to JP,H5-287187,A, for Dimethylamine, Diethylamine, dipropyl amine, diisopropylamine, dibutyl amine, diamylamine, dioctyl Aliphatic series primary amines, such as Sept Iles amine, stearylamine, and cyclohexylamine;

such as ethylstearylamine and butylstearylamine; Triethylamine, Aliphatic series tertiary amines, such as triamylamine, trihexyl amina, and trioctylamine; Triaryl amine, Aliphatic series unsaturation amines auch as oleylamine; Lauryi aniline, As aromatic amina [ auch as stearylaniine, a triphenylamine N.N-Amine, JISECHIRU amine, distearyl amine, methylstearylamine, Aliphatic series secondary amines, amine, di(2-ethylhexyl) amine, didecyl amine, dilauryl

ethylene diamine, 2.4,6-tris(dimethyl aminomethyl) phenol, Although morpholine, N-methylmorpholine, 2-ethyl-4-methylimidazole, 1, and 8-diazabicyclo (5, 4, 0) undecene 7 (DBU) etc. are mentioned, it is etraethylenepentamine, benzylamine, diethylamino propylamine, Xylylene diamine, ethylenediamine, Guanidine, diphenylguanidine, N.N.N., and N.-tetramethyl 1,3-butanediamine, N.N.N.' N'-tetramethyl dimethylaniline, and dimethylbarzyl aniline. I; and other amines, Monoathanolamine, diethanolamine, triathanolamine, Dimethylamino ethanol, diethylanatriamine, triethylonetetramine, nexamethylanediamine, Dodecamethylanediamine, dimethylathylanadiamine, triethylanediamine, not limited to these.

combined. As an example of this hydrolytic sillcon group, X can mention a thing which is a hydrolytic ydrolytic basis can specifically be mentioned, a methoxy group, an athoxy basis, etc. are preferred In this invention, an amino group content silane coupling agent can also be used as a (C) ingredient. pasis among bases expressed with a general formula (1). Although a basis already illustrated as a from a point of a hydrolysis rate. As for espacially the two or more number of a hydrolytic basis. Said amino group content silane coupling agent is a compound which has a basis (henceforth a hydrolytic silicon group) and an amino group containing a silicon atom which a hydrolytic basis thrae or more pieces are preferred. 4s an example of an amino group contant allane coupling agent, gamma-aminopropyl trimethoxysilane, aminopropyl trimethoxysilane, gamma-(2-aminoethyl) aminopropyl methyl dimethoxysilane, gamma-(2vinylbenzyl gamma-aminopropyl triethoxysilane, etc. can be mentioned. Amino modifying sliyl polymer which is the denatured derivative, silanizing amino polymer, an unsaturation aminosilane complex, a phenylamino long chain alkyl silane, amino silanizing silicone, etc. can use these. The abovegamma-aminopropyl triathoxyallane, gamma-aminopropyl trisopropoxy silane, gamma-aminopropyl mentioned amino group content silane coupling agent may be used only by one kind, and may carry gamma-(2-aminoethyl) aminopropyl triisopropoxy silane, gamma-ureido propyltrimethoxysilane, Naminoethyl) aminopropyl triethoxysilane, gamma-(2-aminoethyl) aminopropyl methyldiethoxysilane, phenyl-gamma-aminopropyl trimethoxysilane, N-benzyl-gamma-aminopropyl trimethoxysilane, Nmethyl dimethoxysilane, gamma-aminopropyl methyldiethoxysilane, gamma-(2-aminoethyl) out two or more kind mixing use.

As these (C) ingredients, since co-catalyst ability changes greatly with structure of the (C) ingredient system polymer as a (A) ingredient, aliphatic series secondary amines, such as comparativaly long-ohain aliphatic series secondary amines, such as dioctyl amine and distearyl amine, and itself, compatibility with the (A) ingredient, etc., it is prefarred to choose a compound which was suitable according to a kind of (A) ingredient to ba used. For example, when using an isobutylene

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JP,2008-179830,A [DETAILED DESCRIPTION]

weight sections are preferred to organic polymer 100 weight section of the (A) ingredient, and also its 3.1 - 5 weight section is more preferred. A cure rata may become it slow that loadings of an amine advance. On the other hand, if loadings of an amine compound exceed 20 weight sactions, pot life As for loadings of an amina compound which is the aforementionad (C) ingredient, about 0.01-20 compound are less than 0.01 weight sections, and a hardening reaction becomes fully difficult to may become short too much and is not preferred from a point of workability.

bilane coupling agents other than an amino group content silane coupling agent can also be used for

As functional groups other than an amino group, a sufflydryl group, an epoxy group, a carboxyl group, a constituent of this invention.

gamma-mercapto propyltrimethoxysilane, gamma-mercaptopropyl triethoxysilane, Sulfhydryl group As an example of silane coupling agents other than an amino group content silane coupling agent, a vinyl group, an isocyanate group, isocyanurate, halogen, etc. can be illustrated.

phloropropyltrimetoxysilane, ]; — isooyanurate silanes [, such as tris (trimethoxysilyl) isocyanurate, ]; obyester, etc. which are the derivatives which denaturalized these can be used as a silane coupling propytricthoxysilane, gamma-głycidoxy propyl methyldimethoxyaijane, beta-(3, 4-epoxycyclohaxyl) oxypropyl methyl dimethoxysilane, vinyl type unsaturation group content Silang L such as gammaisocyanatopropyl triethoxysilane, gamma-isocyanate propylmetryl diethoxysilane, and gamma-isocyanate propylmetryl dimethoxysilane, oan be mentioned. A block isocyanate silane, silanizing AKURO yloxy propylmethyl triethoxysilane, ]: — containing halogen Silang [. such as gammaisocyanate group content Silang, such as gamma-isocyanate propyltrimethoxysilane, gammacontent Silang, such as gamma-mercaptpropylmetryl dimethoxysilane and gamma-mercapto aminopropyl trimethoxysilane; Vanyltrimetoxysilane, vinyltriethoxysilane, gamma-methacryloyl methoxyethoxy)Silang, Carboxysilanes, such as N-beta-(carboxymethyl) aminoethyl gammapropylmethyl diethoxysilane; Gamma-glycidoxypropyltrimetoxysilana, gamma-glycidoxy sthyltrimethoxysilane, Epoxy group contant Silang, auch as beta-(3,4-apoxycyclohexyl) athyltriethoxysilane; beta-carboxyethyl triethoxysilane, beta-carboxyethyl phenylbis(2-

The amount of [ in case used of using silane coupling agents other than an amino group content silane coupling agent ] has 0.01 - 20 preferred weight section to (A) ingredient 100 weight section. and also its 0.1 - 5 weight section is more preferred. 0126

litanium oxide, talo, etc. are more proforred than points, such as a reinforcing effect, the increase—in quantity effect, and an ease of acquisition. These fillers may be used independently and may be used carbonate, olay, talo, titanium oxide, aluminium hydroxide, magnesium carbonate, aluminum impalpable various fillers can be used for a hardenability constituent of this invention if needed. As an example nica, walnut shall powder, chaff powder, Graphite, diatomite, clay, fume silica, sedimentation nature together two or more sorts. The amount of [ in case used of using a filler ] has 10 – 1000 proferred bowder, the Flint powder, the end of zinc dust, etc. are raised, Among these fillers, sedimentation nature silica, fume silica, crystalline silica, fused silica, dolomite, carbon black, calcium carbonate, of said filler, for example Wood flour, PARUBU, a cotton ohip, Asbestoa, glass fiber, oarbon fiber, weight section to (A) ingredient 100 weight section, and its 50 - 300 weight section is still more silica, Crystalline silica, fused silica, dolomite, a silicio acid anhydride, carbon black, calcium

\*\*\*\* pithalic ester, such as butyloanzyl pithalate, di-isodecyl pithalate, and JIISO undecyl pithalate. Dioctyl adjate, \*\*\*\* aliphatic dibasic acid ester, such as auccinic acid isodecyl and dioctyl bulking agent, it is more offective. As an example of a plasticizer, dioctyl phthalate, dibutyl phthalate, enlarged or a lot of bulking agents can be mixed if a plasticizer is used, using it together with a in a hardenability constituent of this invention, since clongation of a hardened material can be

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sebacate; Diathylena glycol dibenzoste, \*\*\*\* glycol ester, such as pentaerythritol ester; Butyl oleate, oil, \*\*\*\* epoxy plasticizers, such as epoxidation linseed oil and epoxy staaric soid banzyt; Polyether, phosphorio ester, such as trioctyl phosphate and phosphorio soid octyldiphenyl; Epoxidized soybsan such as a polyester plasticizer, polypropylane glycol which is polyester of dibasic acid and dihydric Polybutadiene, Butadiene Acrylonitrile, polychloroprene, polyisoprene, polybutene, hydrogenation \*\*\*\* aliphatic sories ester species, such as methyl acetyl ricinolata; Tricresyl phosphate, \*\*\*\* polybutadiene, hydroganation polyisoprene, Hydrocarbon system oligomer, such as process oil; alcohol, and its derivative: [ Polly alpha-methylstyrene, ] Polyatyrene, such as polyatyrene;

These plasticizers may be used alone and may be used together two or more sorts. A desirable result will be obtained if the amount of plasticizers is used in the range of one to 200 weight section to reactive-silicon-group-containing-organic-polymer 100 weight section.

chlorinated paraffins are illustrated.

An epoxy resin can be used together in a hardenability constituent of this invention. In this case, an spoxy resin and reactive silicon group containing organic polymer can be reformed.

auch as tetrahydrophtal acid diglycidyl ester and diglycidyl haxahydrophthalate, m-aminophenol series As an epoxy resin, can use a publicly known thing widely conventionally, and For example, a bisphenol spoxy resin, A glycidyl ether type epoxy resin of a bisphenol A propylene oxide addition, Diglycidyl p-A type epoxy reain, Fire retardancy type epoxy resina, such as biaphenol F type epoxy resin and sycidyl ether of tetrabromobisphenol A. Novolak type opoxy resin, a hydroganation biaphenol A type spoxy resin, a diaminodiphenylmethane system epoxy resin. Urethane modified epoxy resin, various isooyanurate, An epoxidation thing of unsaturation polymers, such as giyololy ather of polyhydrio alcohol, such as polyalkylene glycol diglycidyl ether and giyoerin, a hydantoin type opoxy resin, and oxybenzoic acid, phthalic acid digiycidyl ester, Phthalic acid digiycidyl ester system epoxy reains, sycloaliphatic-epoxy-resin, N. and N-diglycidyl aniline, N,N-diglycidyl o-toluidine, triglycidyl petroleum resin, etc. can be mentioned.

It is desirable from a point of a thing containing at least two epoxy groups having high reactivity when hardening, and a hardened material tending to form the three-dimensional network structure into a bisphenol F type epoxy resin, novolsk type epoxy resin, and a phthalic acid diglycidyl ester system epoxy resin can be illustrated from avallability and an adhesive point. molecule, also in these epoxy resins. As a desirable epoxy resin, a bisphenol A type epoxy resin,

carboxylic soid, such as tetrahydro phthalic anhydride and methylene tetrahydro phthalic anhydride, a As a hardaning agent of an epoxy resin, a publicly known hardening agent for epoxy resins can be used widely conventionally. For axample, triethylenetetramine, tatracthylenepentamine, diethylamino DODESHINIRU succinic anhydride, pyromellitic dianhydride, and anhydrous KUROREN acid, alcohols. Diaminodiphenylmethane, diaminodiphanyl sulfone, isophoronediamina, Amines, such as 2,4,6-tria Insidious hardening agents, such as enamines, imidazole derivatives, and dicyandiamides. Boron (dimethyl aminomethyl) phenol, Tertiary amine salta, polyamide resin, ketimines, and aldimine. trifluoride complex compounds, phthalic anhydride, hexahydro prithalic anhydride, Anhydrous propylamine, N-aminoethyl piperazine, m-xylylene diamine, m-phenylenediamine, phenols, and carboxylic acid can be mentioned.

preferred to use it in the range of one to 100 weight section and also ten to 50 weight section, and it An epoxy resin receives reactive-silicon-group-containing-organic-polymer 100 weight section, It is is preferred to bland a hardoning agent of an epoxy resin per epoxy resin 100 weight section in the range of one to 200 weight section and also ten to 100 weight section.

hardenability constituent of this invantion, for example, was described abova is blended, it kneads under ordinary tamperature or heating using a mixor, a roll, a knaader, ato... or an ingredient is dissolved using a little aultable solvents, and a usual method of mixing may be adopted. A 1 liquid An ingredient which limitation in particular does not have in the method of preparation of a

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19/30 ページ

ypa, two-component type, or many liquid type compound can also be built and used by combining

if a hardenability constituent of this invention is exposed into the atmosphere, by operation of moisture, it will form network structure in three dimensions, and will hardan it to a solid which has these ingredients suitably. ubber-like elasticity. n a hardenability constituent of this invention, various additive agents can be added if necded. Other renerate, such as a physical-properties regulator and a silane coupling agent, An antioxidant, radical uring oatalysts as an example of said additive for example (for example, tetravalent tin, divalent tin, nhibitor, an ultraviolet ray absorbent, a metal deactivator, anti-ozonant, light stabilizer, the Lynn system peroxide decomposition agent, lubricant, paints, a foaming agent, a photo-setting resin, a etc.), Adhesive grant agents which adjust the tractive characteristics of a hardened material to hixotropic grant agent, etc. are raised.

An example of such an additive is indicated in each gazette of UP,4-69659,B, UP,7-108928,B, UP,63-254149,A, and JP,64-22904,A, for example. Since a hardenability constituent of this invention has outstanding weatharability, heat resistance, water resisting property, and alactric insulation resulting from a principal chain skeleton and it has

scaling agent, pre-insulation an electric wire, material for cables, a binder, adhesives, a paint, infusion, convaniantly for electrical insulation materials, such as electric alactronic component materials, such a coating material, a sealing agent for rust prevention / water proof, etc. It is useful especially when as a structural elastic sealing compound, a sealing material for multiple glass, a solar cell rear-face igh intensity and a physical-properties improvement effect of high elongation, It can use used for adhesives, a structural clastic sealing compound, or a sealing material for siding.

[Example]

Athough working example and a comparative example explain this invention concretely below, this nvention is not limited to this.

Working example 1-4, comparative example 1) 01411

weight section, Hindered amine light stabiliser (Sankyo Co., Ltd. make, trade name SANORU LS-770) 1010) 1 weight section, and water 5 weight section were measured respectively, and it often kneaded (A) As opposed to isobutylene system polymer (Kaneka Corp. make, trade name EP505Sisobutylene system polymer / paraffin series process oil ≃ 100/50) 150 weight section which has a roactive carbonate (product [ made from Shirolahi Calcium ], trade name SOFUTON 3200) 40 weight section, Benzotriazol system ultraviolet ray absorbent (Ciba-Geigy Japan make, trade name tinuvin 327) 1 weight section, hindered phenolic antioxidant (Giba-Geigy Japan make, trade name IRUGA NOx silicon group as an ingradiant, Epoxy rasin (product [ made from Oil recovery Shell Epoxy ], trade Maruo Calolum Co., Ltd. maka, trade name SHIRETTSU 200) 50 weight saction, Colloid calolum carbonate (Maruo Calolum Co., Ltd. make, trade name MC-5) 50 weight section, Heavy-calolumname Epicoat 828) 5 weight section, Hydrogenation alphe-olafin oligomer (product [ made from idemitsu Petrochemistry ], trada name PAO5004) 60 weight section. Colloid calcium carbonate Photo-setting resin (Toagosei make, trade name ARONIKKUSU M-309) 3 weight section, with a 3 paint roll, and was considered as base resin.

next — as the (B) ingredient — octylic acid (2-ethylbexancic acid) calcium salt (the Nihon Kagaku Sangyo Co., Ltd. make.) The trade name NIKKAOKU Chicks Oa 5% toluene solution was used as a hardening agent [ in / for the thing for which distearyl amire (the Kao Corp. make, Firmin D86) is respectively shown in Table 1 as a (C) ingredient and which could number/ of weight sections /measure, could use the spatula, and was stirred and mixed / working example 1].

Sangyo Co., Ltd. make.) as a trade name NIKKANAFU textile V 2% toluena solution and the (C) nera — as the (B) ingredient of this invention — naphthenic acid vanadium (the Nihon Kagaku

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JP,2008-179830,A [DETAILED DESCRIPTION]

which shows Firmin D86 in Tabla 1 respactivaly is made into working axample 2, (B) as an ingrediant --- octyric acid (2-ettrythexanoic acid) iron (the Nhon Kagaku Sangyo Co., Ltd. make.) The numberf, of furthermore shows respectively lauryl amine (made by Wako Pure Chemical Industries, Ltd.) in Table weight sections ]-used thing which shows respectively lauryl amine (made by Wako Pure Chemical Industrias, Ltd.) in Table 1 as a trada nama NIKKAOKU Chicka Fe 6% tolusne solution and a (C) l as a (B) ingredient as octylic acid (2-ethylhexanoio acid) titanium (3% toluene solution) and a (C) ngredient was made into working example 4. On the other hand, the number[of weight sections ]ingredient — distearyl amine (tha Kao Gorp. maka.) The number[ of weight sections ]-used thing ingredient is made into working example 3. The number[ of weight sections ]-used thing which

These base resin and hardening agents were mixed by the ratio shown in Table 1, respectively, and what constructed the aluminum base material to H type in accordance with the manufacturing

usod thing which shows lauryl amine in Table 1 respectively as (B) octylic acid (2-ethylhexanoic acid) tin (Japanese east transformation Make, trade name neo SUTAN U-28) and a (C) ingredient was

made into the comparative example 1.

method of the tonsile adhesive property specimen to which this is specified JIS A5758-1992 was filled up. Care-of-health conditions were made into 23 \*\*x,7 +50 \*\*x seven days. [ per day ] The used bafore being filled up with the compound, the primer (the Toray Industries Dow Corning make, trade aluminum uses the alumite treatment aluminum of the 50x50x5-mm size based on JIS H4000 as a substrate, After purifying by mathyl ethyl ketone (made by Wako Pure Chamical Industries, Ltd.) name D-2) was dried and used under ordinary temperature for spreading and 30 minutes.

In accordance with tha tensila cament test method of 5758 - 1992 N of JIS A, the examination was presented with H type sample obtained by the above-mentioned method on condition of speed-oftesting 50 mm/min among 23 \*\* and the thermostatic chamber of 50\*\*5% of humidity. [0146]

not air drying equipment for one day, it released from compression and was neglected under the room The recovery was measured by the following methods. First, after making H type sample which ended the above-mentioned care of health immersed into 50 \*\* warm water for one day and taking it out, it temperature on the 1st. The thickness of the sample in this case was measured and the recovery to was neglected under the room temperature on the 1st. Subsequently, after having compressed and fixed to 70% so that sample thickness might be set to 12 to 8.4 mm, and heating a sample in 100 \*\*

conditions of 50% of relative humidity was measured. The one where leather-covered time is shorter lime (leather-covered time) until it fills the same compound in an ointment can simultaneously as a measure which estimates hardanability and stretches a hide on the surface under 23 \*\* and the shows that hardenability is high.

a compressed part was computed.

showing the fracture state in front is a fracture state which can be searched for as a sealing material A result is shown in Table 1. The filled hardaned material is that cohesive failure is shown, and OF

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## 0150]

Using an includione system ophorers an amount ophorers an amount ophorers and including the including control of the ophorers ophorers of the ophorers of the ophorers ophorers of the ophorers of the ophorers ophorers of the ophorers ophorers of the ophorers of the ophorers ophorers

insprurence acid variantim was used (working [0151] (Working example 5, comparative axample 2)

colorime \$203 (made by Kaneka Corp.) 85 weight section, plasticizer (trada nama PPG-2000) 55 weight section and a dioping inhibit or finds in Kausmobo Chemicala. The amount part of trade name DISLPARON 85500 duples, harrordrast system tutravidet tray absorbent (Glar-Oeigy Apam make.) and it kneaded once with 3 paint roll, and also checked that dried by decompression stirring at 120 \*\* CCR120 weight section and titanium oxide (Ishihara Sangyo Kaisha, Ltd. make, trade name TIPAQUE C) The number of weight sections which shows lauryl amine (mada by Wako Pure Chem) which is an cooling a mixture, it added and stirring mixing of the amount part of dehydrator (Nippon Unicar make. for 15 minutes. The octylic acid zirconium (the Nihon Kagaku Sangyo Co., Ltd. make, trade name rade name tinuvin 327) 1 weight section, and hindered amine light stabiliser (Sankyo Co., Ltd. make, rade name A-171) duplexs was carried out for 15 minutes. Next, it added and stirring mixing of the trade name SANORU LS-770) I weight section were measured, and it mixed in \*\*\*\*\*\* the colloid calcium carbonate (the product made from Shiraishi Industry.) which dried this by decompression R-820) 20 weight section, and stirring mixing was carried out for 10 minutes. Took out the mixture, aminosilane coupling agent (Nippon Unicar make, trade name A-1120) 3 weight section was carried NIKKAOKU Chicks Zr:12% toluene solution) which is the (B) ingredient adjusted further beforehand, (A) As a polyether system polymer which has reactant silicon as an ingredient, As opposed to MS stirring at 120 \*\* with 5L planetary mixer beforehand for 2 hours It mixed to trade name Hakuenka for 2 hours, and water content decreased to about 700 ppm with 5L planetary mixer again. After ngredient in Table 2, and the mixed thing were added, and decompression stirring mixing was

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# JP,2008-179830,A [DETAILED DESCRIPTION]

performed for 5 minutes. The cartridge made of paper (goodset made) from the Slowar round cylinder) with the cost was rarried out in said led jow the last information for 5 that the collision of the fact of the collision of 1 fapid node-uning nature on ostillutes in was obtained. When the minute of involve in a hobble, and 1 fapid node-uning nature on constitutes was obtained. When the paper of the paper

actylic acid zirconium and lauryl amine,

temperator for the worw-mentioned Lingland industry instructs constitute ratios a nontemperature for 21 hours or mon, the specimen used for a tensis test set set is the sufficient as follows: the constituted the adminim has mentalist 18 hype is no recordines with the naundiscripting method of the tensis allowine property specimen specimel to USA ASIS-1952 using the cancer of health conditions were made into 23 \*\*\*e1.4 \*\*500 \*\*\*e1.1 injust carriegte as filled to Cherryhealth conditions were made into 23 \*\*\*e1.4 \*\*500 \*\*\*e1.0 \*\*injustry that a measure as a state terraters were likely up with the compound, it was purified by method chylic forth of Julion the administrations are presented with Hypes a tensis comment test method of 793 \*\*\*e1.9 \*\*s10 \*\*e1.9 \*\*s10 \*\*e1.0 \*\*\*e1.0 \*\*e1.0 \*\*e1.0

constituted the adhesive through the involuent demonstrates as a sill and de-unite nature constituted, the adhesive property twen of their involuent demonstrates as a sill and des-unite nature of the adhesive property was checked using another devil profit with selection. The definition of the administration with profit leaves in the administration of the administration o

are made at the for of a tube in it at 16 fill from it inside disenter or the day which the days to messare which and messare which she days to messare which and messare which she days to messare which she days to the state of the state of

investigated. A result is shown in Table 2.

Depths hardenability took out the portion which has hardened the surface which filled in the 80-mm-

ong polyethylene tube 1 liquid mold-curing nature constituent produced in working example 5, and

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working example 5, (B) By using the lauryl amine which acts the carboxylic acid zirconium salt which As opposed to the polyether system polymer which serves as tha (A) ingredient of this invention in acts as a co-catalyst as a (C) ingradient further as a silanol condensation catalyst as an ingredient, adhesive property were revealed and it checked that I liquid mold-curing nature constituent which may be sufficient for practical use was obtained (Table 2). libutyitin diacetyl acetonate as a tetravalent tin catalyst, almost comparable elongation and an Although hardenability was slightly inferior as compared with the comparative example 2 using

Use polyoxypropylene triol of the molecular weight 3,000 [ about ] as an initiator, and propylene oxide (Synthetic example 1)

equivalent was added 1.2 times to the hydroxyl group of this hydroxyl group and polypropylene oxide, molecular weight about 26,000 (polystyrene reduced molecular weight in which the column measured the solvent using THF using the TOSOH TSK-GEL H type using TOSOH HLC-8120GPC as a liquidpolypropylene oxide of tha number average molecular weight 26,000 [ about ] which is an allyl group. and methanol was distilled off, and also tha allyl chloride was added, and the hydroxyl group of the end was changed into the allyl group. By the above, the end obtained 3 organic-functions is polymerized in a zinc hexa cyanocobaltate glyme complex compound catalyst, Number average sending system) polypropylene oxide was obtained. Then, the methanol solution of NaOMe of the

ntroduction rate was measured by the following methods by <sup>1</sup>H-NMR (it measures in a GDCl<sub>3</sub> solvent azcotropically at 90 \*\* and distilling off hexane under decompression. On the other hand, after adding conversion) I, 7.0 g of dimethoxymethy/silane was dropped. After making the mixed solution react at 30micro of platinum divinyl disiloxane complex (it is 3% of the weight of xylene solution by platinum 30 \*\* for 2 hours, unreacted dimethoxymethylsilane was distilled off under decompression and the polypropylene oxide and 10 g of hexane which were obtained above to 1L autoclave, dehydrating eactive silicon group content polyoxyalkylene series polymer (A-1) was obtained. The number The nitrogen purge was carried out, after having added 500 g of ally! and 3 organic-functions average molecular weight of the obtained polymer (A-1) was about 26,000. The silyl group

the peak integral value of CH<sub>3</sub> group (near 1.2 ppm) of the polypropylene oxide main chain of the silyl Receive the peak integral value of CH<sub>2</sub> group (near 1.2 ppm) of the polypropylena oxide main ohain valua of the peak integral value of an allyl and proton (near OH2=CH-CH2=:5.1 ppm): <1>. Receive of said allyl end 3 organic-functions polypropylene oxide before a hydrosilylation reaction. Relative

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JP.2008-179830,A [DETAILED DESCRIPTION]

and polypropylene oxide (A-1) after a hydrositylation reaction. Relative-valua: <2> of the peak integral value of the proton (near CH<sub>3</sub>(CH<sub>3</sub>O) <sub>2</sub>Si-CH<sub>2</sub>-CH<sub>2</sub>-:0.8 ppm) of tha methylene group combined with the silicon atom of the end sily! group to the sily! group introduction rate (<2>/<1>) was 78%

Synthetic example 2)

nitrogen purge of the inside of a container to it, Using an injector, in a container 262.5 ml of ethylcyclohexane (thing dry by neglecting 1 or more night with the molecular sieves 3A), and 787.5 ml After attaching a three-way cock to the resisting pressure glass container of 2L and carrying out the of toluene (thing dry by neglecting 1 or more night with the molecular sieves 3A), p-DCC (the bllowing compound (A)) 4.85g (21.0mmol) was added.

Formula 10]

was made decomprassion using the vacuum pump. After opaning tha neadla valve and introducing an isobutylene monomer in a polymerization vessel from a liquefied gas extraction pipe, the inside of a water washed [ 120 minutes ] the reaction solution 4 times, the allyl end isobutylene system polymer lext, the resisting pressura glass liquefied gas extraction pipe with a naedle valve containing 438 ml (5.15 mol) of isobutylene monomers was connected to the thraa-way cock, and after attaching the polymerization vessel all over dry ica / athanol bus of -70 \*\* and cooling, the inside of a container start, 7.20 g (63.0mmol) of allyl trimethylsilane was added, and the introduction reaction of the allyl container was returned to ordinary pressure by introducing nitrogen from one side in a three-way cock. Next, 0.72 g (7.7mmol) of 2-methylpyridine was added. Next, 10.58 ml (96.5mmol) of titanium group was performed to molecular chain terminals. After adding allyl trimethylsilane and 200 ml of tetrachloride was added, and the polymerization was started. 70 minutes after the polymerization was obtained by distilling off a solvent.

equivalent was added [ mathyl dimethoxysilane ] for 2.4 Eq and a platinum (vinyl siloxane) complex to FT-IR (Shimadzu IR-408) parformed reaction pursuit, and the abaorption based on the olefin of 1640 Subsequently, the allyl end isobutylene system polymer 200g obtained in this way, the paraffin-base process oil (the Idemitsu Kosan make.) which is a hydrocarbon system plasticizer After mixing trade the allyl group of an end to the allyl group of an end, and the hydrosilylation reaction was performed name Diana process PS-32 100g and carrying out temperature up to about 75 \*\*, tha 7.5x10<sup>-5</sup>

2/1 of PS-32 which is the Isobutylene system polymer and plasticizer which have a reactive silicon group in the both ends of the target chain of the mixtures (A-2) of the weight ratio were obtained.

cm-1 disappeared in about 20 hours.

Varian Gemini300) The proton which belongs to each structure by measurement in CDCI<sub>3</sub> (the proton of initiator origin: 6,5–7.5 ppm) The methyl proton combined with the silicon atom of polymer-terminal In this way, if the obtained polymer is measured by the GPC method (it was considered as the liquid-Module1 made from Waters). The number average molecular weight was 17,600 and Mw/Mn (ratio of origin. As a result of measuring and measuring the Intensity of 0.0-0.1 ppm and the resonance signal of methoxy proton 3.4 - 3.5, the end silyl functional group number Fn (number of the silyl group per weight average molecular weight to a number average molecular weight) was 1.23. <sup>1</sup>H-NMR (using sending system and, as for the solvent, the column used CHCl<sub>3</sub> using Shodex K-804 using LC one molecule of isobutylens polymer) was 1.76.

(A) As an ingredient, various additive agents were massured, respectively, and it often kneeded with a (Working example 6-15, comparative example 3)

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26/30 ページ

Next, as a (B) ingradient which is a silanol condensation catalyst, lauryl amina was further measured for the various carboxylic acid metal salt shown in Table 1 to the above-mentioned base resin as a C) ingredient, the spatula was used for it, and it stirred and mixed for 3 minutes. It was made for all the numbers of mols of the metal atom containing the number of addition parts of the various carboxylic acid metal salt of the (B) ingredient to become the same here. 0168

The mold about 3 mm thick was used and filled up with the spatula after mixing, and care of health on 23 \*\*x3 +50 \*\*x the 4th was performed. [ per day ] From the obtained hardened material sheet, the No. 3 type dumbbell specimen specified to JBS (8001 was pierced, and the tensile test was carried out in the autograph (fession specified 200 mm/min.) The modulus (400) in the time of being extended 050, the historially at the time of a dumbbell fracture (TD), and the olongston at the time of a

The combination presentation of base resin, a curing catalyst, etc. and the physical-properties evaluation result of the hardened material obtained from it are shown in Table 3. Jumbbell fracture (Eb) were measured. 0170

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comparative example 3 using 2-othylhexanoic acid tin as a silanol condensation catalyst as shown in When the various carboxyllo acid metal salt of working example 6-15 is usad compared with the

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Table 3, the value of Tb (breaking strength) and Eb (elongation after fracture) of hardened material

High elongation and high intensity were shown. physical properties is largar.

(Working example 16-28, comparative example 4)

ingredient the reactive silicon group obtained in the synthetic example 2, various additive agents were measured, respectively, and it often kneaded with a 3 paint roll according to the formula shown in A) Using the mixture (A-2) of the isobutylene system polymer and plasticizer which have as an

Table 4, and was considered as base resin.

condensation catalyst was measured, and also as a (C) ingredient, lauryl amine was used togother to the above-mentioned base resin, the spatula was used by working example 16-28 and the Next, the various carboxylic acid metal salt shown in Table 4 as a (B) ingredient which is a silanol

comparative example 4 for it, and it stirred and mixed for 3 minutes to it. It was recuperated at 23 \*\* after mixing, and the surface hardened state was evaluated five days afterward, it was made for all the numbers of mole of the metal atom containing the number of addition parts of the various carboxylic acid metal salt of the (B) ingredient to become the same hare.

The evaluation result of the hardened state five days after the combination presentation of base resin, a curing catalyst, etc. is shown in Table 4. What the surface had hardened O in front for five days afterward is shown, and it is shown that x had not hardened five days after. [0175]

[Table 4] [0176]

JP,2008-179830,A [DETAILED DESCRIPTION]

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spite of having used the silanol condensation catalyst of the non-tin series, the surface has hardened When the various carboxylic acid metal salt of working example 16-28 is used as shown in Table 4, in

Practical hardenability was shown.

On the other hand, when the oarboxylic acid zinc of the comparative example 4 was used, nardenability had not hardened five days after bad.

carboxylic acid ziroonium, and a hardenability [ \*\* and others ] constituent, In spite of being a non-tin nolecule, (B) Carboxylic acid calcium, carboxylic acid vanadium, carboxylic acid iron, Carboxylic acid tranium, carboxylic acid potassium, carboxylic acid barium, Carboxylic acid manganese, carboxylic soid nickel, carboxylic acid ocbalt, one or more sorts of carboxylic acid metal salt chosen from a As mentioned above, the organic polymer which has at least one reactive silicon group in the (A) series catalyst, practical hardenability is shown, and it turns out that hardened material physical

properties are also fitness (high clongation and high intensity).

(Constituent using the trimethoxysilyl group as a reactive silicon group)

terminals as a reactive silicon group, a cure rate will become large from the polymer of the synthetic For example, the same hardenability constituent as working example 6-15 can be prepared using tha bolymer indicated for the example 1 of manufacture of JP,H11-12480,A. The tack free time of this methyl dimethoxy silyl group. Such a polymer is indicated to JP,H11=12480,A or JP,2001=72855,A. If a trimethoxysilyl group uses the polyoxyalkylene series polymer which exists in molecular chain example 1. The direction of a trimethoxysllyl group of this is because reactivity is larger than a constituent is shorter than working example 6-15.

constituent is shorter than working example 6-15. Therefore, a catalyst amount can be lessened, if oure time is made into the same grade and the polymer which has the above-mentioned The same hardenability constituent as working example 6-15 can be prepared using the polymer ndicated for the example 1-4 of manufacture of JP,2001-72855,A. The tack free time of this

rimethoxysilyl group will be used.

if the mixture of the polymer which has a trimethoxysilyl group, and the polymer which has a methyl material are freely controllable. For example, the hardenability constituent of working example 6-15 can be prepared using the polymer which mixed the polymor which has a trimethoxysilyl group, and dimethoxy silyl group is used as a polymer, cure time and the physical properties of a hardened the polymer which has a methyl dimethoxy sliyl group by the weight ratio of 1:10-10:1.

[0182] Working example when the polymer which has a trimethoxysilyl group is used is shown below.

The inside of bottom of N, atmosphere 1L autoclave, According to a composite metal complex (Synthetio example 3)

polyoxypropylene (A-3) by which the trimethoxysilyl group was introduced into about 80% of ends was number average molecular weight 17,000 and the polyoxypropylene diel 1000g of molecular-weightdistribution Mw/Mn=1.20 as 19g of gamma-isocyanate propyltrimethoxysilane (Nippon Unicar make transformation [ Japanese east ]) is added, it reacted at 90 \*\* until the isocyanate group was no longer detected in IR under the nitrogen air current in this, and the reactive sillicon group content compound catalyst. It polymerizes. The obtained polypropylene oxide. Use and to the compound Y-5187), and a catalyst. 0.05 g of dibutyl tin screw isooctylthioglycolate (made in [ U-360 ]

(Working example 29-32)

ingretients according to the formula shown in Table 6 using the polycoxyalitylene series polymer (A-3) which has the trimethoxyality group obtained in the synthetic example 3, (C) Lauryl amine which is an (A) The polyoxyalkylene series polymer (A-1) which has as an ingredient the methyl dimethoxy silyl group obtained in the synthetic example 1. The various carboxylic acid metal salt which is the (B)

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JP.2008-179830,A [DETAILED DESCRIPTION]

ngredient was measured, respectively, the spatula was used, and it stirred and mixed for 30 seconds It was made for all the numbers of mols of the metal atom containing the number of addition parts of surface was lightly pressed down with the spatula after mixing, and time (leether-covered time) until s constituent stops adhering at the tip of a spatula was measured. An evaluation result is shown in the various carboxylic acid metal salt of the (B) ingredient to become almost the same here. The

Table 5 0185

able 5.

			4		
		62	30	31	22
(A) 磁谷	A-1	901		100	
	A-3		100		100
(8) 成分	1495-972数68(T) (II 日本化学産業 (株)	9.9	9.9		
				5.6	5.8
(C) RES	ラウリルアミン	99.0	9.68	99.0	95.0
	皮強り動物 (23C)	Atain	21nfe	300minCL L	105mln

# (2):2-エチルヘキサン部カルシウムのミネラルスピリット溶液、金属(Ca) 含有量:5% (1):2-11子ルヘキサン関係のミネラルスピリット等後、砂質(Fe) 合有機:6%

As shown in Table 5, the polyoxyalkylene series polymer (A-3: working example 30 and 32) which has a trimethoxysilyl group had the oure rate quicker than the polyoxyalkylene series polymer (A-1: working example 29 and 31) which has a methyl dimethoxy silyl group.

example 3. The tack free time of this constituent has short cure time, and good physical properties The same hardenability constituent as working example 6-15 can be prepared using the polyoxyalkylene series polymer (A-3) which has the trimethoxysllyl group obtained in the synthetic

Constituent which used the epoxy resin together)

which used together reactive silloon group containing organic polymer and an epoxy resin. When this The same hardenability constituent as working example 6-15 can be prepared using the constituent constituent is used, the manifestation of adhesive strength is quick.

Industrial applicability]

mechanical physical property which has high intensity and high clongation as compared with the case the hardenability constituent of this invention is very useful as various elastomers, such as a sealing revealing practical hardenability and stability, the hardened material obtained shows the outstanding stom, and has at least one silicon content group which can construct a bridge by forming a siloxane bond, (B) Carboxylio acid calcium, carboxylio acid vanadium, carboxylio acid iron. Carboxylio acid ttanium, carboxylio acid potassium, carboxylio acid barum, The hardenability constituent containing where the carboxylic acid tin currently used conventionally is used as a curing catalyst. Therefore, (A) The organic polymer which has the hydroxyl group or hydrolytic basis combined with the allicon one or more sorts of oarboxylic acid metal salt which it comes to choose out of carboxylic acid manganese, carboxylic soid nickel, carboxylic soid cobalt, and a carboxylic acid zirconium. While naterial, adhesives, a binder.

Translation done.]

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